

Rec'd PCT/PTO 06 MAY 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/041996 A3

(51) International Patent Classification⁷: A61B 5/04

(21) International Application Number:
PCT/IL2003/000913

(22) International Filing Date:
3 November 2003 (03.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/423,973 6 November 2002 (06.11.2002) US

(71) Applicant (for all designated States except US): RAMOT
AT TEL AVIV UNIVERSITY LTD. [IL/IL]; 32 Haim
Levanon Street, 69 975 Tel Aviv (IL).

(72) Inventors; and
(73) Inventors/Applicants (for US only): BEN-JACOB,
Eshel [IL/IL]; 8 Harav Ashi Street, 69 395 Tel Aviv (IL).
SEGEV, Ronen [IL/IL]; 9 Yosef NaGlili Street, 52 416
Ramat Gan (IL). BARUCHI, Itay [IL/IL]; 11 Yehuda
Hamacabee Street, 62 669 Tel Aviv (IL). HULATA, Eyal

[IL/IL]; 28 Eliyahu Salman Street, 94 511 Jerusalem (IL).
SHAPIRA, Yoash [IL/IL]; 23 Neue Reim, 49 323 Petah
Tikva (IL). HANEIN, Yael [IL/IL]; 54 Shlonski Street,
69 410 Tel Aviv (IL). GABAY, Tamir [IL/IL]; P. O. Box
3633, 60 920 Kadima (IL).

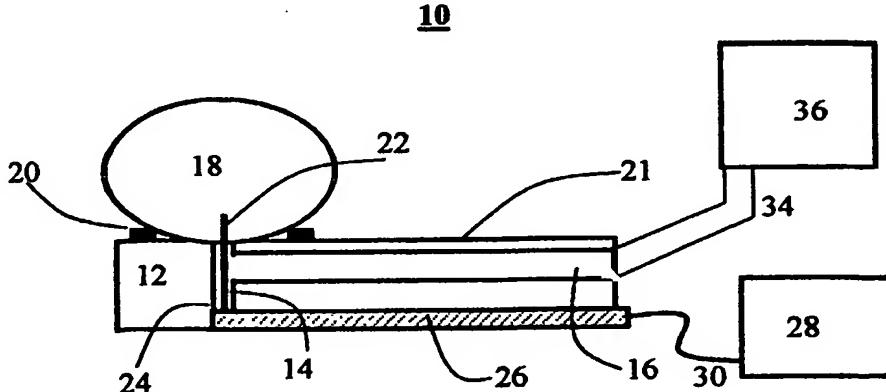
(74) Agent: G. E. EHRLICH (1995) LTD.; 11 Menachem Be-
gin Street, 52 521 Ramat Gan (IL).

(81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, EG, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK (utility model), SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: SYSTEM FOR AND METHOD OF POSITIONING CELLS AND DETERMINING CELLULAR ACTIVITY THEREOF



(side view)

WO 2004/041996 A3

(57) Abstract: A device for positioning at least one cell in at least one addressable position, the device comprising a substrate (12) formed with at least one addressable pore (14) and at least one channel (16) embedded in the substrate and being held in fluid communication with the at least one pore. The at least one pore and the at least one channel are designed and constructed such that an under-pressure formed in the at least one channel results in vacuum adherence of the at least one cell onto the at least one pore, such that a single cell is vacuum adhered onto a single pore. In one embodiment, the substrate is a non-conductive substrate and is further formed with one or more electrode structures (22), where each of the electrode structures is positioned in one of the pores. In an additional embodiment the device is designed to be locatable on an organ, such as the brain.



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:
28 October 2004

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IL03/00913

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61B 5/04
US CL : 600/373

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 600/373, 378; 607/116-118; 435/173.4, 287.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,461,304 A (KUPERSTEIN) 24 July 1984 (24.07.1984), See entire document.	1-368
A	US 4,969,468 A (BYERS et al) 13 November 1990 (13.11.1990), See entire document.	1-368
A, E	US 6,699,697 B2 (KLEMIC et al) 02 March 2004 (02.03.2004), See entire document.	1-368
A, E	US 2004/0006264 A (MOJARRADI et al) 08 January 2004 (08.01.2004), see entire document.	1-368

Further documents are listed in the continuation of Box C.

See patent family annex.

• Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

31 August 2004 (31.08.2004)

Date of mailing of the international search report

14 SEP 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents

P.O. Box 1450
Alexandria, Virginia 22313-1450

Faxsimile No. (703) 305-3230

Authorized officer

Lee S. Cohen

Telephone No. 703-308-2998